

GNSS Reflectometer Instrument for Bi-static Synthetic Aperture Radar (GRIBSAR) Measurements of Earth Science Parameters, Phase II Project

SBIR/STTR Programs | Space Technology Mission Directorate (STMD)



ABSTRACT

Global Navigation Satellite System (GNSS) signals scattered from ocean, land and ice are affected by the reflecting surface, and hence the changes induced by the surface can be observed. The full-time operation of radio navigation satellites system, abundant global signal coverage and spread spectrum communication for flexible signal processing makes GNSS reflected signals a viable candidate for Signal-Of-Opportunity (SOO) passive sensing. Existing research has shown that GNSS-Reflectometry (GNSS-R) based remote sensing has the potential to give environmental scientists a low-cost, wide-coverage measurement network that will greatly increase our knowledge of the Earth's environmental processes. The Intelligent Automation, Inc. (IAI) team proposes to develop a GNSS Reflectometer Instrument for Bistatic Synthetic Aperture Radar (GRIBSAR) for measuring earth science parameters. Our proposed approach is modular, scalable and meets the NASA goals of multi-channel, GNSS-R system to exploit GNSS reflected signals as SOO.

ANTICIPATED BENEFITS

To NASA funded missions:

Potential NASA Commercial Applications: NASA/ Government applications are: ? Multi-Channel direction finding receivers ? Algorithm development platform. ? Phased-Array Passive Radar receivers. ? Ocean altimetry, measurement of ocean roughness and Sea-Ice monitoring. ? Multi-Channel, real-time, waveform recorders

To the commercial space industry:

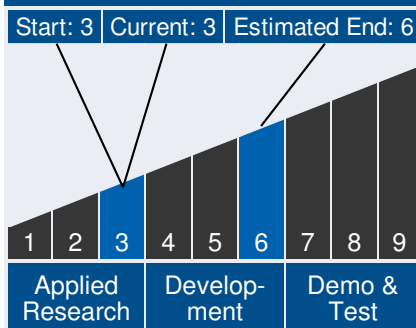
Potential Non-NASA Commercial Applications: Non-NASA commercial applications are: ? Real-time digital processors. ? Multi-node Network emulators ? Passive direction-finding and asset tracking



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Technology Maturity



Management Team

Program Executives:

- Joseph Grant
- Laguduva Kubendran

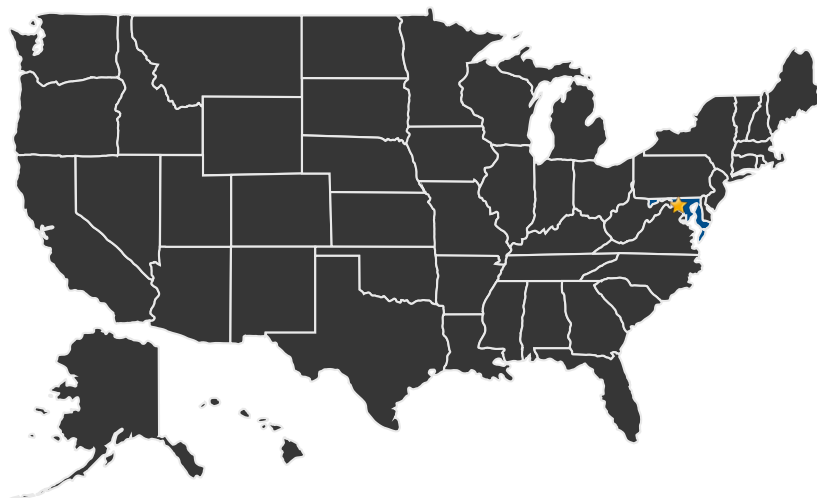
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U.S. WORK LOCATIONS AND KEY PARTNERS



■ U.S. States
With Work

★ **Lead Center:**
Goddard Space Flight Center

Other Organizations Performing Work:

- Intelligent Automation, Inc. (Rockville, MD)

PROJECT LIBRARY

Presentations

- Briefing Chart
 - (<http://techport.nasa.gov:80/file/23187>)

Management Team *(cont.)*

Program Manager:

- Carlos Torrez

Principal Investigator:

- Arvind Bhat

Technology Areas

Primary Technology Area:

Science Instruments,
Observatories, and Sensor
Systems (TA 8)

- └ Remote Sensing Instruments
and Sensors (TA 8.1)
 - └ Microwave, Millimeter-,
and Submillimeter-
Waves (TA 8.1.4)

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IMAGE GALLERY



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DETAILS FOR TECHNOLOGY 1

Technology Title

GNSS Reflectometer Instrument for Bi-static Synthetic Aperture Radar (GRIBSAR) Measurements of Earth Science Parameters, Phase II

Potential Applications

NASA/ Government applications are: ? Multi-Channel direction finding receivers ? Algorithm development platform. ? Phased-Array Passive Radar receivers. ? Ocean altimetry, measurement of ocean roughness and Sea-Ice monitoring. ? Multi-Channel, real-time, waveform recorders